PRACTICAL POINTS ON PRIVATE NURSING

IN CHARGE OF

ISABEL MCISAAC

DIPHTHERIA

By JAMES B. HERRICK, M.D.
Associate Professor of Medicine, Rush Medical College, Chicago

I HAVE been asked by your editor to write an article on diphtheria in the hope that it might emphasize some of the more recent views regarding the origin, nature, and treatment of this all too prominent disease.

When we consider that not so many years ago it was questioned even by physicians of experience whether diphtheria was contagious or not, we see that a great change has taken place in our conception of the disease. It is now generally recognized as a contagious disease, and the contagium—that is, the infectious material—is known to be a definite micro-organism, and the danger of the spread of the disease lies in the fact that the organism from the throat of the affected individual may get into the throat of a healthy individual.

While diphtheria may affect other parts of the body, such as the mucous membrane of the eye or mouth, or a wound of the skin, it is found oftenest in the nose, throat, or larynx. The organism, the Klebs-Löffler bacillus, usually lodges in the throat or on the tonsil. It may possibly find the field unfavorable for development, in which case there will be no evidence of the disease. In other instances it finds the soil favorable, it multiplies, and produces the local evidences of inflammation in redness, swelling, and an exudate. This exudate, in the case of this germ, is characteristically rather firm, of a whitish or grayish color, and adheres closely to the underlying mucous membrane, so that if an attempt is made to remove it, there is frequently left a bleeding surface. The diphtheria germ is peculiar in this,—that it very rarely gains entrance to the body proper—that is, it very rarely enters the blood. The question may be asked, " How, if this is the case, do we have such marked constitutional symptoms in cases of diphtheria?" The answer is that the germ, multiplying in the throat, in some way produces a most virulent poison, to which the name diphtheria toxin has been applied. It is this poison that is absorbed by the lymphatics and veins, that enters the blood, producing a most profound toxæmia, and it is this poison that, coming in contact with all the cells and tissues of the body, produces most serious changes in nerves, muscles, heart-muscle, kidneys—in fact, all the organs of the body. It is the absorption of this poison from the tonsil or from the nose by the lymphatics that produces the swelling in the lymphatic glands which forms such a striking feature in many cases of diphtheria. These glands are apparently striving to act as a barrier to the too rapid dissemination of the poison, and in their efforts become swollen and frequently tender. In some cases too there is an inflammation of the tissue around about the gland, causing a diffuse, brawny infiltration in the neck, though in this case there is often, as will be referred to later on, a mixed infection, and other organisms than the diphtheria germ are at work.

There are great differences in the clinical manifestations of diphtheria as met with in different individuals. These differences depend upon different numbers of the organism, different degrees of virulence of the germ, different amounts of toxin produced, differences in the virulence of the toxin, the rapidity of absorption, the resisting power of the individual, and his ability to eliminate the poison. We see here why, if virulent diphtheria germs attack an individual who is already debilitated, with a lowered resisting power, whose kidneys are perhaps poor eliminators, the disease may run a rapidly fatal course. On the other hand, if milder germs attack an individual whose resisting power is great, whose eliminating power is also great, the disease may run a mild course.

There are great variations in the local as well as constitutional manifestations of the disease. In some instances the throat shows but a very slight exudate, and the diagnosis can only be made by careful bacteriological examination. In others the exudate has such a characteristic color and spreads so rapidly over the tonsil and the soft palate to the back of the throat, out into the nose, and even out on to the upper lip, that without a bacteriological examination it is an easy matter to recognize the nature of the disease.

Pain in the throat is variable, in some instances being very slight, in others a most distressing symptom. So likewise is the amount of swelling. This may be trifling, or it may be as great as in cases of suppurative tonsillitis or quinsy, the tonsils meeting in the centre, and there being much œdema in all the pharyngeal tissue.

The initial chill of the patient may be slight or may be pronounced. An attack of vomiting may usher in the disease. The temperature may rise to a high point, or it may never be much elevated, and it is well to know that too much reliance should not be placed on the temperature as an evidence of the severity of the disease, for in some of the most severely toxic cases the temperature is quite low or at times even subnormal. The pulse will increase in rapidity, and in the severer cases will become rapid and small. There is destruction of red blood-corpuscles, and in the severer types of the disease the patient rapidly becomes pale, the countenance often showing a peculiar ashy look, so that one can make a probable diagnosis of diphtheria, without even looking at the throat, when he sees a child with an ashy-gray-looking face, a swollen neck, and hears the peculiar breathing that tells of the obstruction in the nose and in the throat. It is rendered easier if the physician detects the horribly offensive odor that comes from the throat in many instances.

The appetite, as a rule, is poor, and in many cases it is a severe problem how best to get the little patient to take nourishment. The bowels are generally constipated, although diarrhœa may occur. The urine is diminished in amount and high-colored, as in most febrile affections, and a trace of albumin is not at all uncommon,—in fact, it may be regarded as the rule.

The duration of untreated diphtheria varies from a few days to about two weeks. In cases that go untreated the termination of the disease is indicated by the gradual disappearance of the membrane from the throat, the subsidence of the swelling in the neck, the lowering of the temperature to normal, the dropping of the pulse-rate, and the return of the appetite. The patient, if he has gone through a severe attack, is left weak, anæmic, and quite prostrate. He may show for many weeks the effect of the serious illness through which he has passed.

The dangers of diphtheria and the mode of death may perhaps be grouped as follows: First, toxæmia. This has already been discussed. It is the cause of death in perhaps the majority of cases, the violent poison being absorbed in large quantities, which so depresses the heart and the nerve centres, and so interferes with the function of the kidney and other important organs, that death may be said to result from the toxæmia *per se*. Second, death may be the result of sudden cardiac failure. This in reality is but the result of the toxæmia already described. The manner of death, however, is here so peculiar that it deserves a separate classification. The muscle and nerves of the heart are frequently seriously affected, and at times—even when the local manifestations of the disease have disappeared, when the temperature is normal, when the child is beginning to eat more, and has even been allowed to sit up in bed or get out—there is a sudden failure of the heart, death occurring instantly. This is sometimes preceded by a rapid, fluttering pulse, by dyspnœa and cyanosis, by a gasping respiration, which may last for a few minutes or a few hours. This is the dreaded death in diphtheria—sudden failure of the heart. Third, there may be a mechanical obstruction of the larynx, constituting the diphtheritic laryngitis, or diphtheritic croup. In a few instances diphtheria involves the larynx primarily. Almost always, however, there has been primary trouble in the throat, so that the laryngitis is secondary. A warning of the existence of laryngitis is given by the hoarse, croupy cough of the child, by the gradual loss of the voice, so that it becomes but a whisper, and as the obstruction becomes more and more marked by the difficulty in breathing, the child becoming more restless, more cyanotic, covered with perspiration, the pulse getting weaker, and the efforts at inspiration being accompanied more and more by retraction or sinking-in of the soft parts, such as the supraclavicular spaces, the epigastrium, etc. Unless surgical interference or treatment with antitoxin is applied at the right time, death is a very common result in these cases of diphtheritic croup. Fourth, death may occur from the spread of the disease to the trachea, bronchi, and the development of a broncho-pneumonia. In some instances the pneumonia is due to the inhalation of bits of exudate from the throat or from the larynx. Fifth, death may occur from any intercurrent or complicating disease, such as croupous pneumonia, or the diphtheria toxin may cause an acute Bright's disease. Sixth, mention has already been made of secondary or mixed infection. By this is meant that the patient is infected not only with the diphtheria bacillus, but with other germs. The germs of true pneumonia already mentioned would be one instance. The pus germs not infrequently act at the same time as the diphtheria germ. These may gain entrance to the body through the tonsil, and may be the cause of not only severe local trouble, such as suppuration of the glands of the neck or suppuration of the cellular tissue of the neck, but may be the cause of a genuine septicæmia or blood-poisoning. This is not infrequently the cause of death in diphtheria. At times these germs, that produce pus, exert their influence locally in distant parts of the body to which they are carried by the blood. We find then that the patient with diphtheria has pus in the pleural cavity, pus in the joints, pus on the valves of the heart, and ulcerative endocarditis. It may be mentioned here, explaining why the antitoxin treatment is not always successful, that a patient may in reality die cured of his diphtheria, succumbing really to a septicæmia induced perhaps by some such organism as the streptococcus pyogenes; that is, dying of the secondary or mixed infection. When we think of the many possible causes and modes of death in diphtheria, and consider the rapidity with which the organism multiplies, the virulence of its toxins, we need not wonder at the previous high mortality of the disease when anywhere from ten to forty out of every hundred died.

(To be continued.)